Program of the 2nd International Workshop on Reacting Particle-Gas Systems

June, 16th-18th 2025
Magdeburg, Germany

Monday, June 16th
(Hall 2/West of Building 14, Campus at Universitätsplatz 2)

18:00 - 22:00	*Welcome reception with finger food & drinks,* *Possibility of registration*

On the following pages, the presenter's are underlined, and only their affiliation is provided for the sake of brevity, even if other institutions are involved in the study.

Tuesday, June 17th (Johanniskirche)

Starting 8:00	*Registration opens*	
8:30-9:00	Welcome address & Introductory presentation (D. Thévenin)	
9:00-9:50	**Keynote I: Aibing Yu, Monash University** (Chair: E. Tsotsas) Simulation and modelling of particulate systems	
	Nave: **DEM & CFD** (Chair: B. van Wachem)	Seminar room: **Advanced experimental techniques** (Chair: O. Speck)
10:00-10:20	Simulation of hydrogen combustion in a gas-fired lime shaft kiln S. Meschede, S. Haep, D. Bathen Institut für Umwelt und Energie, Technik und Analytik (IUTA)	Using AI, positron imaging, and insider knowledge to digitally optimise industrial fluid- and particle-handling systems K. Windows-Yule University of Birmingham
10:20-10:40	Advanced heat exchange and radiation sub-models in coarse-grained CFD-DEM simulations M. Mitterlindner, M. Niemann, D. Louw, P. Kieckhefen, C. Goniva, M. Salehi, S. Radl Graz University of Technology	State of the art of three selected techniques for advanced solids flow diagnostics: MPT, MST and high frequency radar D. C. Guío-Pérez, D. Pallarès Chalmers University of Technology
10:40-11:10	*Coffee break*	
11:10-11:30	Consistent Euler-Lagrange point-particle modeling using the volume-filtering framework M. Hausmann, B. van Wachem Otto von Guericke University Magdeburg	Development of a PET-like system for particle tracking Y. Hartych, N. Böhle, M. Fink, M. Fritsch, M. F. H. Heinsius, T. Held, T. Holtmann, M. Huckestein, J. Oppotsch, M. Steinke, C. Wais, U. Wiedner Ruhr University Bochum
11:30-11:50	Experimental study on sludge drying characteristics and optimized design of dryer based on CFD-DEM simulation R. Zou Monash University	A configurable real-time data acquisition system for PEPT in particle-gas flow measurement D. Passaretti, E. Antonecchia, N. D'Ascenzo Otto von Guericke Univ. Magdeburg
11:50-12:10	Locally resolved DEM/CFD simulations of a generic oxy-fuel kiln for lime production M. Brömmer, E. Illana, V. Scherer Ruhr University Bochum	Unveiling the power and limitations in X-Ray imaging of organic materials S. Gruber, N. Vorhauer-Huget, E. Tsotsas, P. Först Technical University of Munich
12:10-12:30	Mean flow properties in a packed bed with varying geometry W. Sadowski, H. Demir, F. di Mare Ruhr University Bochum	High-spatial-resolution Raman distributed temperature sensing system J. M. López Bonilla, F. Beyrau Otto von Guericke Univ. Magdeburg
12:30-13:30	*Lunch*	

13:30-14:20	**Keynote II: Tina Kasper, Univ. Paderborn** (Chair: F. Beyrau) Experimental investigation of particle-laden systems	
	Nave: **Iron & metal particles** (Chair: M. Schiemann)	Seminar room: **Plastics & biomass decomposition** (Chair: K. Umeki)
14:30-14:50	The role of hydrogen flow rates in the direct reduction of iron ore pellets: Investigating external mass transfer limitations M. L. Ali, S. Fong, Q. Fradet, U. Riedel German Aerospace Center (DLR)	Modeling of plastic pyrolysis F. Zhang, M. Li, S. Tavakkol, T. Zirwes, D. Stapf Karlsruhe Institute of Technology
14:50-15:10	CFD-DEM investigation of agglomeration effects in iron powder reduction J. G. Ramírez, Y. Tang, M. Van Sint Annaland, N. Deen, I. Roghair Eindhoven University of Technology	Interplay of primary and secondary reactions during PMMA pyrolysis - Experiments and modeling S. Pielsticker, K. Gfall, R. Kneer RWTH Aachen University
15:10-15:30	Experimental and numerical investigation of iron ores in conditions relevant to hydrogen-based direct reduction for green steelmaking S. La Manna, K. Qyteti, D. Barletta, E. Illana, S. Z. Ajabshir, V. Scherer, M. Poletto University of Salerno	Temperature measurement during the ignition and combustion of particle clouds using two-color-pyrometry M. Giesen, D. Bernhardt, M. Beckmann TU Dresden
15:30-15:50	Development of a conversion model for the hydrogen reduction of iron ore based on single-pellet experiments F. An, F. Küster, M. Gallwitz, S. Guhl, M. Gräbner, G. Herz, A. Richter TU Bergakademie Freiberg	Methodology for derivation of effective heat transfer properties by pore network modeling F. Faber, S. Bhaskaran, A. Dieguez-Alonso, N. Vorhauer-Huget Otto von Guericke University Magdeburg
15:50-16:20	*Coffee break*	

16:20-16:40	Cross-code comparison of carrier-phase DNS of turbulent iron particle cloud combustion P. Ghofrani, T. D. Luu, O. T. Stein, A. Kempf Duisburg-Essen University	Implications of oxidative atmosphere, heating rate and complex reaction schemes in the bulk reactions of reconstituted tobacco sheets used in an electrically heated tobacco product F. Cerciello, C. Russo, R. Migliaccio, M. M. Oliano, B. Apicella, O. Senneca CNR Naples
16:40-17:00	An equilibrium description of the envelope flame surrounding a burning magnesium particle Z. Wang, S. Cheng, F. Sewerin Hong Kong Polytechnic Univ.	Reaction kinetics of biogenic fuel gasification for chemical looping M. Schmitt, L. Lindmüller, S. Heinrich Hamburg University of Technology
17:00-17:20	Analysis of iron ore reduction using hydrogen for energy storage and transport S. Schmitt, O. Narin, B. Brosch, V. Scherer, C. Yannakis, F. Cerciello, A. Fabozzi, O. Senneca Doosan Lentjes	Effect of pyrolysis atmosphere on biochar production from spruce bark, needle, twig and forest residue L. Wang, E. Magnanelli, A. Diéguez-Alonso SINTEF Energy Research
17:20-17:40	Molecular dynamic investigation of nanoparticle formation during iron microparticle combustion L. Elsäßer, Y. Gao, A. Dreizler, T. Li TU Darmstadt	Cascade utilization of chemical component in biomass with supercritical carbon dioxide H. Jin Xi'an Jiaotong University

Festung Mark

18:30 - 23:00	*Gala dinner*

Wednesday, June 18th (Johanniskirche)

8:30-9:20	**Keynote III: Tamás Turányi, Eötvös Univ.** (Chair: D. Thévenin) Validation and optimization of detailed reaction mechanisms supported by the ReSpecTh information site	
	Nave: **Packed, moving & fluidized beds** (Chair: S. Heinrich)	Seminar room: **Nanoparticles, dust & powders** (Chair: R. Kneer)
9:30-9:50	Rheology model for simulation of particle flow in moving-bed reactors Y. Kaymak, T. Piontek, T. Hauck, K. Qyteti, E. Illana, V. Scherer VDEh-Betriebsforschungsinstitut	Continuum model and benchmarking experiment of powder mixing in a cylindrical bladed mixer A. M. Baecke, A. P. Ganesh Ruthraruba, U. Hampel, G. Lecrivain Helmholtz-Zentrum Dresden-Rossendorf e.V.
9:50-10:10	Hydrodynamic interactions between particles suspended in a fluid medium S. Hassanzadeh Saraei, B. Peters University of Luxembourg	Ignition and flame propagation in mixtures of combustible dusts with hydrogen P. Zhao, D. Gabel, U. Krause Otto von Guericke University Magdeburg
10:10-11:40	**POSTER SESSION** (see separate list) with *Coffee break*	
11:40-12:00	Coarse graining / multi-level coarse graining and its application to fluidized systems H. Kruggel-Emden, V. Brandt TU Berlin	Comparison of 1D and 3D models for the thermochemical conversion of carbonaceous pulverized particles M. Kiss, T. Nanz, M. Bösenhofer TU Wien
12:00-12:20	Simulation of plastics pyrolysis in fluidized bed with a lumped reaction kinetic model M. Li, F. Zhang, S. Tavakkol, T. Zirwes, O. Stein, D. Stapf Karlsruhe Institute of Technology	Scalable production of nanostructured materials for energy and health applications using gas phase deposition J. R. van Ommen Delft University of Technology
12:20-12:40	Scale-up of CFD-DEM simulation of fluidized bed gasification by GPU acceleration C. Graf, Y. Lichtmannegger, J. Ströhle, B. Epple TU Darmstadt	Correlations between electrical conductivity, optical properties, and structural characteristics of carbon nanoparticles F. P. Hagen, F. J. Bauer, D. Zimmermann, P. A. B. Braeuer, M. Bauer, D. Kretzler, H. Bockhorn, S. Will, D. Trimis Karlsruhe Institute of Technology

12:40-13:00	Transient drag behaviour on non-spherical Geldart B coal particle in air fluidised bed reactor R. Goswami, V. Kumar IIT Roorkee	Investigation of the hetero-aggregation mechanisms of nano particles by desublimation in the supersonic flow M. Nestriepke, M. Weirich, D. Misiulia, S. Antonyuk RPTU Kaiserslautern-Landau
13:00-14:00	*Lunch*	

14:00-14:50	**Keynote IV: Berend van Wachem, Otto von Guericke University Magdeburg** (Chair: V. Scherer) A new paradigm for computing the hydrodynamic forces of particles in CFD/DEM point-particle simulations	
	Nave: **Heat transfer & electric heating** (Chair: A. Bück)	Seminar room: **Rotating drums** (Chair: A. Diéguez Alonso)
15:00-15:20	Simulation of methanol steam reforming in packed bed reactors – comparison of wall-heated and induction-heated configurations M. Dal Belo Takehara, K. Umeki Luleå University of Technology	Eulerian-Eulerian modelling of biomass thermal conversion in a rotary kiln C. Álvarez-Bermúdez, H. Khodaei, S. Chapela, M. A. Gómez, S. Adhikari, J. Porteiro Universidade de Vigo
15:20-15:40	Dynamic microwave freeze-drying with in-situ neutron imaging: Insights in the drying of particle bulk M. Hilmer, Z. Kis, M. Schulz, P. Först Technical University of Munich	Investigation of granule mixing in a rotating drum with camera, ultrafast Xray and numerical simulations T. N. Papapetrou, M. Bieberle, F. Barthel, U. Hampel, G. Lecrivain Helmholtz-Zentrum Dresden-Rossendorf
15:40-16:00	Modelling a lab-scale microwave dryer for thermally thick materials A. Ujjani Narasimhaiah, A. Schmidt, L. Briest, A. Tretau, R. Wagner, E. Tsotsas, N. Vorhauer-Huget Otto von Guericke Univ. Magdeburg	Influence of moisture reduction of conidiated rice on particle collision in rotating drum D. B. Ferreira, N. Vorhauer-Huget, E. Tsotsas, J.C. Thoméo São Paulo State University

16:00-16:20	Regenerative absorption and desorption between CO_2 and dolomite particles for CCS processes A. Kropman, W. Aliyu, E. Specht, F. Beyrau Otto von Guericke University Magdeburg	Experimental and DEM analysis of transverse particle motion in a rotary drum with cross section internals J. Hahne, F. Herz Anhalt University of Applied Sciences
16:20-16:40	Investigation of flame–particle interactions in model packed beds using dual-phosphor thermometry and CH* chemiluminescence imaging H. Khodsiani, M. R. Niaz, F. Beyrau, B. Fond Otto von Guericke University Magdeburg	Experimental investigation of thermal mixing of monodisperse particles in a rotary drum W. Ma, N. Vorhauer-Huget, E. Tsotsas Otto von Guericke University Magdeburg
16:40- open end	*Coffee break, end of workshop*	

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177	Dynamics of bubble interface during obstacle interaction	M. Outokesh, M. Saeedipour, M. W. Hlawitschka JKU Linz
176	Influence of the solvent hydrodynamics on the phase residence time distribution behaviour in a solid-liquid counter-current screw-extraction process	A. Lehr, R. K. Bhuva, G. Janiga, A. Seidel-Morgenstern, D. Thévenin Otto von Guericke University Magdeburg
185	Coiled Flow Inverter-assisted green synthesis of FexOy/g-CN nanoparticles for sustainable energy and environmental applications	S. S. Tomar, N. Verma, K. D. P. Nigam Indian Institute of Technology Delhi
117	Experimental approach for measuring aerosol inhalation dose in enclosed environments	M. A. Cavagnola, A. Aldnifat, H. Kryk, U. Hampel, G. Lecrivain Helmholtz-Zentrum Dresden-Rossendorf
129	Phase tracking in gas-solid fluidized beds via electrical capacitance volume tomography and borescopic high-speed camera imaging	L. Lindmüller, S. Heinrich, J. Theuerkauf, Y. Yao, Y. Fan Hamburg University of Technology
134	Millimeter-wave FMCW radar for industrial gas and heating process monitoring	F. Schenkel, J. Mahendran, J. Schorlemer, D. Tsukanova, T. Musch, A. Diéguez-Alonso, N. Vorhauer-Huget, C. Schulz, J. Barowski, I. Rolfes Ruhr University Bochum
178	A radar-based system for localizing marker particles in bulk materials	J. Schorlemer, F. Schenkel, N. Karsch, E. Gramlich, J. Barowski, T. Musch, I. Rolfes Ruhr University Bochum
108	Flow field measurements in polyhedral packed beds – optical access to gas-solid systems	C. Velten, K. Hülz, K. Zähringer Otto von Guericke Universität Magdeburg
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124	Experimental investigation of the thermal radiation propagation in different bulk porosities	M. Tyslik, B. Jaeger, M. Schiemann Ruhr University Bochum
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182	Modelling of packed bed biomass thermal conversion via CFD-DEM advanced approach	I. Wardach-Swiecicka Institute of Fluid-Flow Machinery Gdansk
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